

WHAT IS CLAIMED IS:

1. A radiation detector having a wavelength
conversion member for converting radiation into light
and a sensor panel for detecting light converted by the
5 wavelength conversion member, wherein:

after projections formed on a surface of the
wavelength conversion member to be bonded to the sensor
panel are made small, the wavelength conversion member
and the sensor panel are bonded together.

10 2. A radiation detector according to claim 1,
wherein a height of each projection before bonding is
50 μm or lower.

15 3. A radiation detector according to claim 1,
wherein the wavelength conversion member and the sensor
panel are bonded together by an adhesion layer, and the
adhesion layer has such a thickness as a resolution
response to light converted by the wavelength
20 conversion member is at least 0.7 or larger.

4. A radiation detector according to claim 1,
wherein the whole surface of the wavelength conversion
member is covered with a protective layer.

25 5. A radiation detector according to claim 1,
wherein the wavelength conversion member is made of

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caesium iodide.

6. A radiation detector having a wavelength
conversion member for converting radiation into light
5 and a sensor panel for detecting light converted by the
wavelength conversion member, wherein:

after top surfaces of projections formed on a
surface of the wavelength conversion member to be
bonded to the sensor panel are made parallel to a
10 surface of the sensor panel, the wavelength conversion
member and the sensor panel are bonded together.

7. A radiation detector according to claim 6,
wherein the wavelength conversion member and the sensor
15 panel are bonded together by an adhesion layer, and the
adhesion layer has such a thickness as a resolution
response to light converted by the wavelength
conversion member is at least 0.7 or larger.

8. A radiation detector according to claim 6,
20 wherein the whole surface of the wavelength conversion
member is covered with a protective layer.

9. A radiation detector according to claim 6,
25 wherein the wavelength conversion member is made of
caesium iodide.

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10. A scintillator panel having a wavelength
conversion member formed on a substrate, the wavelength
conversion member converting radiation into light, and
projections formed on a surface of the wavelength
conversion member on the side opposite to the substrate
being made equal to or smaller than a threshold value.

11. A scintillator panel according to claim 10,
wherein the threshold value is 50 μm .

12. A radiation detector having the scintillator
panel recited in claim 10 and a sensor panel for
detecting light converted by the scintillator panel.

13. A scintillator panel having a wavelength
conversion member for converting radiation into light,
wherein:

a first protective layer is formed on the
wavelength conversion member, projections on a surface
of the wavelength conversion member are made small or
removed from the upper side of the first protective
layer, and thereafter a second protective layer is
formed.

14. A scintillator panel according to claim 13,
wherein a height of each projection is 50 μm or lower
before the second protective layer is formed.

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15. A scintillator panel according to claim 13, wherein the wavelength conversion member is made of caesium iodide.

5 16. A radiation detector having the scintillator panel recited in claim 13 and a sensor panel, wherein a plane of the scintillator panel whose projections and recesses are made small is bonded to a light reception plane of the sensor panel.

10 17. A radiation detector according to claim 16, wherein the second protective layer also serves as an adhesion layer for bonding the scintillator panel and the sensor panel.

15 18. A radiation detector according to claim 16, wherein the wavelength conversion member and the sensor panel are bonded together by an adhesion layer, and the projections are made small so that a thickness of the
20 adhesion layer is 50 μm at a maximum or thinner.

 19. A radiation detector according to claim 16, wherein the wavelength conversion member and the sensor panel are bonded together by an adhesion layer, and the
25 adhesion layer has such a thickness as a resolution response to light converted by the wavelength conversion member is at least 0.7 or larger.

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20. A radiation detector according to claim 16, wherein the wavelength conversion member is made of caesium iodide.

5 21. A method of manufacturing a scintillator panel having a wavelength conversion member formed on a substrate, the wavelength conversion member converting radiation into light, the method comprising a step of:

10 making projections formed on a surface of the wavelength conversion member on the side opposite to the substrate equal to or smaller than a threshold value.

15 22. A method according to claim 21, wherein a first protective layer is formed on the wavelength conversion member, projections on a surface of the wavelength conversion member are made small or removed from the upper side of the first protective layer, and thereafter a second protective layer is formed.

20 23. A method according to claim 21, wherein the threshold value is 50 μm .

25 24. A method according to claim 21, wherein the projections are made small by crushing the projections.

25 25. A method according to claim 21, wherein the

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projections are made small by scraping the projections.

26. A method according to claim 21, wherein the
projections are made small by cutting off portions of
5 the projections.

27. A method according to claim 21, wherein the
projections are made small by using laser.

10 28. A method according to claim 21, wherein prior
to making the projections are made small, a height of
each projection is measured, and if the height of the
projection exceeds a predetermined threshold value, the
projection is made small so that the height is equal to
15 or smaller than the threshold value.

29. A method according to claim 21, wherein each
projection is measured in accordance with a detection
result of a contrast of a surface image of the
20 wavelength conversion member.

30. A method of manufacturing a radiation
detector having a wavelength conversion member for
converting radiation into light and a sensor panel for
25 detecting light converted by the wavelength conversion
member, the method comprising a step of:

after making small projections formed on a surface

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of the wavelength conversion member to be bonded to the sensor panel, bonding the wavelength conversion member and the sensor panel.

5 31. A method according to claim 30, wherein:

 a first protective layer is formed on the wavelength conversion member, projections on a surface of the wavelength conversion member are made small or removed from the upper side of the first protective layer, and thereafter a second protective layer is
10 formed.

 32. A method according to claim 30, wherein the wavelength conversion member and the sensor panel are
15 bonded together by an adhesion layer, and the projections are made small so that a thickness of the adhesion layer is 50 μm at a maximum or thinner.

 33. A method according to claim 32, wherein when
20 the adhesion layer is sandwiched between the wavelength conversion member and the sensor panel, a thickness of the adhesion layer is adjusted by adhesive agent between the wavelength conversion member and the sensor panel.

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 34. A method according to claim 32, wherein the adhesion layer is made of adhesive agent flowed in a

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gap having a thickness of 50 μm at a maximum between the wavelength conversion member and the sensor panel.

35. A method according to claim 33, wherein the
5 adhesive agent is pressure sensitive adhesive agent.

36. A method according to claim 30, wherein the projections are made small by crushing the projections.

10 37. A method according to claim 30, wherein the projections are made small by scraping the projections.

38. A method according to claim 30, wherein the projections are made small by cutting off portions of
15 the projections.

39. A method according to claim 30, wherein the projections are made small by using laser.

20 40. A method according to claim 30, wherein prior to making the projections are made small, a height of each projection is measured, and if the height of the projection exceeds a predetermined threshold value, the projection is made small so that the height is equal to
25 or smaller than the threshold value.

41. A method according to claim 30, wherein each

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projection is measured in accordance with a detection result of a contrast of a surface image of the wavelength conversion member.

5 42. An apparatus for manufacturing a scintillator panel having a wavelength conversion member for converting radiation into light, the apparatus comprising:

10 means for detecting projections and recesses on a surface of the wavelength conversion member;

 means for measuring a height difference of the projections and recesses;

 means for comparing the height difference with a predetermined threshold value; and

15 means for reducing the sizes of the projections and recessed in accordance with a comparison result.

20 43. An apparatus according to claim 42, wherein the threshold value is set to such a value as a resolution response of an image output through radiation detection takes at least a value of 0.7 or larger.

25 44. A radiation detector system having the radiation detector recited in claim 1, image processing means for processing signals output from the radiation detector as an image, recording means for recording

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signals output from the image processing means, display means for displaying signals output from the display means, and transmission means for transmitting signals output from the image processing means.

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